

Notes on some Eulophinae (Hymenoptera, Chalcidoidea, Eulophidae) in Korea

Jong Cheol Paik

Department of Agricultural Biology, Suncheon National
University, Suncheon 540-070, Korea

Abstract In this study on Korean Eulophinae, a total of 39 species is reported. Among them, 16 species are recorded for the first time from Korea. One new specific synonymy is proposed: *Elachertus tabashii* Nakayama, 1938, syn. nov. of *Stenomesus japonicus* (Ashmead, 1904).

Key words systematics, Hymenoptera, Chalcidoidea, Eulophidae, Eulophinae, Korea

INTRODUCTION

Family Eulophidae is relatively large group in number of genera and species, which are often cosmopolitan in distribution. The eulophids have very unusual biological features; the species are specific in their habits, confining their attacks very largely to the pterygote insects or to certain other arthropods. In 1979, Kamijo reported on the Eulophidae of North Korea for the first time. Prior to him, information concerning the eulophid fauna of the Korean Peninsula was vague. Kamijo reported 54 species, including two new species, *Chrysocharis pektusana* (= *C. arctica*) and *Chrysonotomyia yamagishii*, and left 9 species undescribed. Keys to the palaearctic eulophid genera are not available, but some papers by Graham (1959), Bouček (1959a, b, 1988) and Peck et al. (1964) are useful in keying the common genera. As a result of the present survey, 39 species of Eulophinae are reported, among which 16 species are new to Korea. One new specific synonymy is proposed.

SYSTEMATICS

Subfamily Eulophinae

1. *Euplectrus platyhypenae* Howard, 1885 검정가시좀벌 (新稱)
(Figs. 1-2)

Euplectrus platyhypenae Howard, 1885, Bull. U. S. Dept. Agr., Div. Ent., 5: 26-27, 31, 45.

Euplectrus nigriceps Ferriere, 1941, Bull. ent. Res., 32: 42.

Euplectrus nigriceps: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 17;

Graham, 1963, Trans. Soc. Brit. Ent., 15: 172.

Eupectrus plathyphenae: Burks, 1979 in Krombein et al., Eulophidae, Cat. Hym. America north of Mexico, p. 978. Emendation.

Euplectrus platyhypenae: Peck, 1963, Can. Ent. Suppl., 30: 168; Bouček & Graham, 1978, Entomologist's Gazette, 29: 233.

The main characters which can be separated *platyhypenae* from the other related species: mid lobe of mesoscutum with median carina; head entirely black; scutellum shagreened; all funicular segments longer than the pedicel. This species is one of the well known parasites of cutworms and armyworms in North America. This is newly recorded from Korea.

Specimens examined. KOREA-1 female, 29. V. 1979, Gwangju, JN; 1 female, 17. VIII. 1980, Gyeongju, GN; 1 female, 3. VIII. 1982, Mt. Gaya(650 m), GN; 3 females, 14. X. 1983, 1 female, 6. VII. 1983, 1 female, 5. VII. 1980, 1 male, 20. V. 1980, Suweon, GG; 1 male, 25. VI. 1983, Chuncheon (Mt. Obong), GW.

Host. Unknown.

Distribution. Korea, North America.

2. *Euplectrus bicolor* (Swederus, 1795) 가시줄벌 (新稱)

(Figs.3-4)

Pteromalus bicolor Swederus, 1795, Svensk Vetensk. Akad. Handl., 16: 204.

Euplectrus maculiventris Westwood. 1832, London, Edinb. and Dublin Phil. Mag. and Jour. Sci., (3), 1: 128.

Elachestus albiventris Nees, 1834, Hym. Ichneum. aff. Monogr., 2: 146.

Euplectrus furnius Walker, 1843, Ann. Mag. Nat. Hist., 12: 48.

Euplectrus intactus Walker, 1872, Notes on Chalcididae, pt. VI, p. 102.

Eulophus bicolor: Walker, 1839, Monogr. Chalciditum, 1: 173.

Euplectrus bicolor: Thomson, 1878, Hym. Scand., 5: 187; Ferriere, 1941, Bull. ent. Res., 32: 41; Graham, 1959, Trans. Soc. Brit. Ent., 13: 175; 1963, Trans. Soc. Brit. Ent., 15: 172; Peck, 1963, Can. Ent. Suppl., 30: 164; Bouček, & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 15; Askew, 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 7; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 251.

Euplectrus sp., Paik, 1978, Korean J. Pl. Prot., 17: 178.

Specimens examined . KOREA-10 females, 3 males, ex *Pseudaletia separata*, em. 20. VII. 1982, Suweon, GG; 1 female, 29. V. 1980, 1 female, 13. IX. 1980, 1 female, 14. X. 1980, 1 female, 1.VII. 1983, Suweon, GG; 2 females, 19. IX. 1982, Namhansanseong, GG; 2 females, 17. IX. 1982, Mt. Baikbong, GG; 1 female, 16. IX. 1982, 2 females, 3. X. 1982, Mt. Cheonma, GG; 1 female, 5. VII. 1982, Seoul; 1 female, 1. IX. 1982, Geumgok, GG; 1 female, 14. VIII. 1982, 2 females, 1 male, 3. VIII.

1982, Mt. Gaya, GN; 4 females, 30. V. 1979, Mt. Sudo, GB.

Host. *Pseudaletia separata* (Walker) (Lep., Noctuidae).

Distribution. Korea, Japan, Europe, Mongolia, North America.

3. *Platyplectrus laeviscutus* (Thomson, 1878) 납작가시좀벌 (新稱)

(Figs. 5–6)

Euplectrus laeviscuta Thomson, 1878, Hym. Scand., 5: 188–189.

Euplectromorpha laeviscuta: Ferriere, 1941, Bull. ent. Res., 32: 24, 29; Erdős, 1966, Ann. hist.-nat.

Mus. nat. hung., 58: 396; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 17.

Trichoplectrus laeviscuta: Bouček & Graham, 1978, Entomologist's Gazette, 29: 234–235.

The specimens from Korea well agree with the characters of *laeviscutus* given by Erdős (1966). Dr. Kamijo kindly examined the Korean material and confirmed it. This species is new to Korea.

Specimens examined. KOREA-1 male, 1. IX. 1982, Geumgok, GG; 1 male, 19. IX. 1982, Seongnam, GG; 1 male, 21. VII. 1984, Cheongyang (Mt. Chilkap), CN.

Host. Unknown.

Distribution. Korea, Europe.

4. *Platyplectrus pannonicus* (Erdős, 1966) 애납작가시좀벌 (新稱)

(Fig. 7)

Euplectromorpha (*Trichoplectrus*) *pannonica* Erdős, 1966, Ann. hist.-nat. Mus. nat. hung., 58: 398–399.

Euplectromorpha (*Trichoplectrus*) *pannonica*: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 18.

All of the specimens studied are from Korea. Their superficial characters are agree well with the original description. Dr. Kamijo confirmed my identification. The species is newly recorded from Korea.

Specimens examined. KOREA-1 female, 6. VII. 1983, 1 male, 4. VIII. 1980, Suweon, GG; 1 male, Mt. Cheonma, GG; 2 males, 27. VII. 1984, Seogwipo, JJ.

Host. Unknown.

Distribution. Korea, Europe.

5. *Platyplectrus* ? *chlorocephalus* (Nees, 1834) 수도납작가시좀벌 (新稱)

(Fig. 8)

Elachestus chlorocephalus Nees, 1834. Hym. Ichneum. aff. Monogr., 2: 146.

Euplectromorpha (*Trichoplectrus*) *chlorocephala*: Erdős, 1966, Ann. hist.-nat. Mus. nat. hung., 58: 396, 399; Bouček, & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 18.

The materials examined are agreed with the characters of *chlorocephalus* mentioned in Erdős (1966). According to Dr. Kamijo(pers. comm.), Korean species might be identified as *chlorocephalus* but there is a possibility that it would be a closely related species. This species has not been previously recorded from Korea.

Specimens examined. KOREA-1 female, 29. V. 1979. Mt. Sudo(500 m), GB; 1 male, 31. V. 1979, Mt. Sudo (1000 m), GB.

Host. Unknown.

Distribution. Korea, Europe.

6. *Stenomesius japonica* (Ashmead, 1904) 노랑좀벌 (新稱)
(Fig.9)

Sympiesomorpha japonica Ashmead, 1904, Jour. New York ent. Soc. 12: 163.

Sympiesomorphellus whitmani Girault, 1916, Ann. ent. Soc. Ameri., 9: 300.

Stenelachistus impressus Masi, 1917, Novit. zool., 24: 201.

Euryscotolinx coimbatorensis Rohwer, 1921, Ann. Mag. nat. Hist., (9), 7: 134.

Sympiesomorpha chilonis Ishii, 1937, Knotyu, 11: 110.

Elachertus tabashii Nakayama, 1938, Ann. Agr. Expt. Stn. Chosen, 10: 28, **syn. nov.**

Sympiesomorpha mikan Ishii, 1953, Bull. Fac. Agr. Tokyo Univ. Agr. Tech., 1(2): 4.

Stenomesioideus ashmeadi Subba Rao et Sharma, 1966, Indian J. Ent., 28: 299.

Cirrospiloideus japonica: Swezey, 1946, B. P. Bishop Mus. Bull., 189: 211.

Cirrospiloideus japonicus: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 26.

Stenomesius japonicus: Kamijo, 1976, Kontyu, 44: 484, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 252; Bouček, 1976, Entomophaga, 21: 402.

The present species is somewhat variable in the extent of dark spots on the body. The spots may be greatly reduced, but usually the one on the vertex and another covering the apex of scutellum, and the anterior part of the propodeum are present. Sometimes the head, thorax, and also a spot on the middle of the gaster are dark.

Specimens examined. KOREA-3 females, 2 males, ex unidentified lepidopterous leaf-miners on *Diospyros kaki*, em. 29. IX. 1979, Jeonju, JB; 4 females, 1 male, ex unidentified Agromyzidae on *Populus glandulosa*, em. 21. VII. 1980, Suweon, GG; 4 females, ex *Paraleucoptera sinuella*, em. 31. VII. 1980, Suweon, GG; 1 female, 13. VII. 1973, 1 female, 17. VII. 1980, Suweon, GG; 1 female, 22. VII. 1982, Mt. Baikong, GG; 1 female, 16. IX. 1982, Mt. Cheonma, GG.

Host. Gracillariidae-*P. ringoniella* (Matsumura). Phyllocnistidae-*Phyllocnistis citrella* Stainton; Pyralidae-*Chilo suppressalis* (Walker); Noctuidae-*Naranga aenescens* Moore. Lyonetiidae-*Paraleucoptera sinuella* (Reutti). Unidentified Agromyzidae.

Distribution. Korea, Japan, China, Oriental Region, Egypt, Seychelles Islands, South Mariana Islands, Caroline Islands.

Remarks. *Elachertus tabashii* Nakayama was described from Korea based on male and female specimens which were reared from *Naranga aenescens* Moore. The brief original description agrees well with *Stenomesus japonicus*. Therefore, I propose *E. tabashii* as a synonym of *S. japonicus*. I could not find the Nakayama's type-specimens in the Institute of Agricultural Sciences, Suwon (= Suigen), Korea. They are probably located in the United States National Museum (see Kamijo, 1976).

7. *Elachertus isadas* (Walker, 1839) 수염허리좀벌 (新稱)

(Fig.10)

Eulophus isadas Walker, 1839, Monogr. Chalciditum, 1: 168.

Eulophus ticida Walker, 1839, Monogr. Chalciditum, 1: 179.

Elachestus splendens Foerster, 1841, Beitr. Monogr. Pteromal., p. 39.

Eulophus scyllis Walker, 1848, List. Hym. Brist. Mus. Chalcidites, pt. 2, p. 234.

Elachistus viridulus Thomson, 1878, Hym. Scand., 5: 195.

Elachertus isadas: Graham, 1959, Trans. Soc. Brit. Ent., 13: 176; Bouček & Askew, 1968, Palearctic Eulophidae, Index ent. Ins., p. 22; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 11.

The Korean specimens studied are agreed well with the original description and the diagnostic characters given by Askew (1968). The species is new to Korea.

Specimens examined. KOREA-1 male, 31. V. 1979, Mt. Sudo (500 m), GB; 2 females, 1 male, 26. VI. 1983, Chuncheon (Mt. Samak), GW.

Host. Unknown.

Distribution. Korea, Europe, Mongolia.

8. *Elachertus charondas* (Walker, 1839) 오봉허리좀벌 (新稱)

(Figs.11-12)

Eulophus charondas Walker, 1839, Monogr. Chalciditum, 1: 174.

Eulophus orsus Walker, 1839, Monogr. Chalciditum, 1: 174.

Elachistus punctiscuta Thomson, 1878, Hym. Scand., 5: 195.

Elchistus monochae Ruschka in Ruschka & Fulmek, 1915, Z. angew. Ent., 2: 398.

Elachertus charondas: Graham, 1959, Trans. Soc. Brit. Ent., 13: 176; Bouček & Askew, 1968, Palearctic Eulophidae, Index ent. Ins., p. 21; Askew, 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 11.

In Europe, this species is solitary or gregarious larval ectoparasite of *Lymantria monacha* (Linnaeus) (Lep., Lymantriidae) and *Beta parasinana* (Linnaeus) agree well with the diagnostic characters given by Graham (1959) and Askew (1968). Dr. Kamijo kindly confirmed this species for me, comparing with authentic European specimens. This species is newly recorded from Korea.

Specimens examined. KOREA-2 females, 7. VIII. 1982, Gwang-neung, GG; 1 female, 25. VI. 1983, Chuncheon(Mt. Obong), GW; 1 female, 14. VIII. 1980, Mt. Gaya(650 m), GN; 1 female, 31. V. 1979, Mt. Sudo(500 m), GB.

Host. Unknown.

Distribution. Korea, Europe, Mongolia.

9. *Elachertus inunctus* Nees, 1834 긴털허리좀벌(新稱)

(Figs.13-14)

Elachertus inunctus Nees, 1834, Hym, Ichneum. aff. Monogr., 2: 145.

Eulophus florianus Walker, 1839, Monogr. Chalciditum, 1: 176.

Eulophus eucrate Walker, 1839, Monogr. Chalciditum, 1: 176.

Eulophus neleus Walker, 1839, Monogr. Chalciditum, 1: 177.

Elachistus sublaevis Thomson, 1878, Hym. Scand., 5: 195.

Elachistus floridanus: Dalla Torre, 1898, Cat. Hym., 5: 78. Emendation.

Elachertus sublevis: Dalla Torre, 1898, Cat. Hym., 5: 81. Emendation.

Elachertus florianus: Graham, 1959, Trans. Soc. Brit. Ent., 13: 176; Askew, 1962, Entomologist, 95: 189.

Elachertus inunctus: Foerster, 1956, Hym. Stud., 2: 73; Thomson, 1878, Hym. Scand., 5: 193; Schmiedeknecht, 1909, Genera Insectorum, 97: 395; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 22; Askew, 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 10; Bouček, 1971, Acta ent. Mus. nat. Pragae, 38: 527; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 252; Ujiye, 1980, Bull. Fruit Tree Res. Stn. ser. C (Morioka), 7: 119.

This species is a larval ectoparasite of leaf-mining Lepidoptera. It is rather easily separated from other members of the genus in having the following characters: the mid lobe of mesoscutum strongly produced backward, with three pairs of long bristles; the scutellum mostly smooth and shining; and the abdomen very long, more than twice as long as broad.

Specimens examined. KOREA-3 females, 13. VII. 1983, Mt. Weolak, CB; 1 female, 14. VIII. 1980, Mt. Gaya (650 m), GN; 1 male, 26. VI. 1983, Chuncheon (Mt. Samak), GW; 1 female, 24. VI. 1980. Mt. Seolak, GW; 1 female, 31. VI. 1979, Mt. Sudo, GB; 2 females, 17. IX. 1982, Mt. Baikbong, GG.

Host. Unknown[in Japan-*Phllonorycter ringoniella* (Matsumura) (Lep., Gracillariidae)].

Distribution. Korea, Japan, Europe.

10. *Elachertus pilosiscuta* Bouček, 1971 털보허리좀벌(新稱)

Elachertus pilosiscuta Bouček, 1971, Acta ent. Mus. nat. Pragae, 38: 525-527.

The host of this species has not been known until now. One male Korean specimen agrees well with the original description. The species is newly recorded from Korea. Morphological feature of the

thorax of this species is near to *E. inunctus* Nees. However, it is fundamentally different from the latter in having the mid lobe of mesoscutum anteriorly covered with numerous hairs (in *inunctus* with three pairs of long bristles and with several short additional bristles), and in having the eyes very densely pubescent (in *inunctus* less dense). On the other hand, it is also closely related to *E. isadas* (Walker) but which it can be distinguished from the latter by having the mid lobe of mesoscutum usually strongly produced backwards.

Specimens examined. KOREA-1 male, 26. VI. 1983, Chuncheon and (Mt. Samak), GW.

Distribution. Korea, Europe.

11. *Elachertus artaeus* (Walker, 1839) 서호허리좀벌 (新稱)
(Fig.15)

Eulophus artaeus Walker, 1839, Monogr. Chalciditum, 1: 172.

Elachestus carinatus Ratzeburg, 1848, Ichneum. Forstinsect., 2: 172—173.

Elachistus petiolatus Thomson, 1878, Hym. Scand., 5: 191.

Elachertus artaeus var. *clavatus* Erdős, 1966, Ann. hist.-nat. Mus. nat. hung., 58: 401.

Elachertus artaeus: Graham, 1959, Trans. Soc. Brit. Ent., 13: 176; Kerrich, 1961, Bull. ent. Res., 52: 771; Bouček, 1964, Beitr. Ent., 14: 668; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 20; Askew, 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 11

Specimens examined. KOREA-1 female, 30. V. 1979, Mt. Sudo(300 m), GB; 4 males, 24. VIII. 1974, Suweon, GG.

Host. Unknown.

Distribution. Korea, Europe, Mongolia.

Remarks. This species is known in Europe as a gregarious larval ectoparasite of various Lepidoptera (Tortricidae, Noctuidae, Notodontidae). It is new to Korea.

12. *Elachertus longipetiolus* Bouček, 1971 긴허리좀벌 (新稱)
(Figs.16—17)

Elachertus longipetiolus Bouček, 1971, Acta ent. Mus. nat. Pragae, 38: 527—529.

Specimens examined. KOREA-1 female, 24. VI. 1980, Mt. Seolak, GW; 2 females, 14. VIII. 1980, 1 male, 3. VIII. 1982, Mt. Gaya(650 m), GN; 5 females, 2 males, 29. V. 1979, Mt. Sudo(500 m), GB; 1 male, 20. VI. 1980, Suweon, GG.

Host. Unknown.

Distribution. Korea, Europe.

Remarks. No host is known for this species. The specimens examined are well agreed with the original description. This species is new to Korea.

13. *Elachertus argissa* (Walker, 1839) 털허리좀벌 (新稱)

(Figs.18-19)

Eulophus argissa Walker, 1839, Monogr. Chalciditum, 1: 172.

Eulophus saon Walker, 1839, Monogr. Chalciditum, 1: 175.

Eulophus eurybates Walker, 1839, Monogr. Chalciditum, 1: 178.

Elachistus opaculus Thomson, 1878, Hym. Scand., 5: 193.

Elachertus argissa: Graham, 1959, Trans. Soc. Brit. Ent., 13: 176; Kerrich, 1961, Bull. ent. Res., 52: 771; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 20; Askew, 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 11; Bouček, 1971, Acta ent. Mus. nat. praeae, 38: 530; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 252.

It has been known that this species attacks small lepidopterous insects in Europe (Tortricidae, Gelechiidae). It is easily distinguished from the related species by the long gastral petiole and densely pubescent on male flagellum.

Specimens examined. KOREA-1 female, 18. V. 1980, Gocheon (near Suweon), GG; 1 female, 7. VIII. 1982, Gwangneung, GG; 1 female, 17. IX. 1982, Mt. Baikbong, GG; 1 male, 4. VIII. 1982, Mt. Yongmun, GG; 1 female, 13. VIII. 1983, Mt. Weolak, CB.; 1 male, 29. IX. 1980, Gimcheon, GB; 2 females, 3. VIII. 1982, Mt. Gaya, GN; 6 females, 29. V. 1979, 7 females, 28. V. 1979, 1 female, 1 male, 31. V. 1979, Mt. Sudo(1000 m), GB.

Host. Unknown.

Distribution. Korea, Japan, Europe, Mongolia.

14. *Hyssopus nigrifulus* (Zetterstedt, 1838) 검정호리허리좀벌(新稱)

Entedon nigrifulus Zetterstedt, 1838, Insecta Lapponica, 1: 430.

Cirrospilus aphaca Walker, 1839, Monogr. Chalciditum, 1: 329.

Elachertus nigrifulus: Thomson, 1878, Hym. Scand., 5: 196; Schmiedknecht, 1909, Genera Insectorum, 97: 395; Graham, 1959, Trans. Soc. Brit. Ent., 13: 175; Askew, 1962, Entomologist, 95: 189; 1964, Bull. ent. Res., 55: 55; 1968, Handbk. Id. Brit. Ins., V. 8, Hym., 2(b): 10; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 23; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 252.

This species is most closely related to *geniculatus* (Ratzeburg). It differs from the latter in having not flattened thorax (almost horizontal in *geniculatus*), the marginal vein 2.5 times as long as the stigmal vein (nearly 3 times in *geniculatus*), and the male antennal scape normal, uniformly broad throughout (inflated in *geniculatus*).

Specimen examined. KOREA-1 female, 7. VIII. 1982, Gwangneung, GG.

Host. Unknown[in Europe-Tortricidae, Cochylidae, Cosmopterygidae].

Distribution. Korea, Europe, Mongolia.

15. *Aulogymnus (Olynx) japonicus* (Ashmead, 1904) 흑좀벌(新稱)

Ophelinoideus japonicus Ashmead, 1904, Jour. New York ent. Soc., 12: 163.

Ophelinoideus japonicus: Girault, 1920, Proc. U. S. nat. Mus., 58: 200; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 27.

Olynx japonicus: Kamijo, 1976, Kontyu, 44: 483

Host. Cynipidae on *Quercus acutissima* (Hymenoptera).

Distribution. Korea, Japan.

Ramarks. I examined two female specimens which were collected in Suweon (14. V. 1957) and deposited at the Entomological Institute of Hokkaido University, Japan. They were reared from cynipid galls on *Quercus* by Dr. W. H. Paik.

16. *Cirrospilus curvineurus* Askew, 1965 검은털좀벌(新稱)

Cirrospilus curvineurus Askew, 1965, Proc. R. ent. soc. Lond., (B), 34: 1-2.

Cirrospilus curvineurus: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 32; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 13; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 253.

Host. Unknown [in Europe-*Stigmella* sp., (Lep., Nepticulidae)].

Distribution. Korea(North), Europe.

Remarks. This species was reported from North Korea by Kamijo (1979), but I did not collect it in the southern part of the Korean peninsula. In Europe, the species attacks *Stigmella* sp. on *Salix*.

17. *Cirrospilus diallus* Walker, 1838 노랑털좀벌(新稱)

(Figs.20-21)

Cirrospilus diallus Walker, 1838, Ann. Nat. Hist., 1: 312.

Eulophus quadrimaculatus Foerster, 1841, Beitr. Monogr. Pteromal., p. 41.

Eulophus flavomaculatus Ratzeburg, 1844, Ichneum. d. Forstins., 1: 164.

Cirrospilus walkeri Stephens, 1846, Illustr. Brit. Ent. Suppl., p. 10.

Entedon punctatus Ratzeburg, 1848, Ichneu. d. Forstins., 2: 165.

Cirrospilus elegantissimus: Walker, 1838, Ann. Mag. Nat. Hist., 1: 310; Thomson, 1878, Hym. Scand., 5: 201(nec Westwood).

Atomosomoidea diallus: Delucchi, 1958, Entomophaga, 3: 247.

Cirrospilus diallus: Graham, 1958, Trans. Soc. Brit. Ent., 13: 177; 1963, Trans. Soc. Brit. Ent., 15: 174; Erdős, 1956, Fol. ent. hung., (s. n.), 9: 3; Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 175; 1965, Acta ent. Mus. nat. Pragae, 36: 552; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 32; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 13; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 253.

Specimens examined. KOREA-4 females, 29. V. 1979, Mt. Sudo, GB.

Host. Unknown.

Distribution. Korea, Japan, Europe, Mongolia.

Remarks. This species is a larval ectoparasite of leaf-mining insects, chiefly Lepidoptera and rarely their parasites. In Japan, it was reared from *P. ringoniella* by Ujiye (1980). For further Japanese host-records, see Kamijo(1987).

18. *Cirrospilus lyncus* Walker, 1838 금강털쭈벌(新稱)

(Fig.22)

Cirrospilus lyncus Walker, 1838, Ann. Nat. Hist., 1: 381.

Eulophus unifasciatus Foerster, 1841, Beitr. Monogr. Pteromal., p. 41.

Cirrospilus caudatulus Thomson, 1878, Hym. Scand., 5: 203.

Cirrospilus caudatus: Dalla Torre, 1898, Cat. Hym., 5: 82.(misspelling).

Cirrospilus unifasciatus: Ferriere, 1953, Boll. Ist. Ent. Univ. Bologna, 19: 396.

Atoposomoidea unifasciata: Delucchi, 1958, Entomophaga, 3: 248.

Cirrospilus lyncus: Graham, 1959, Trans. Soc. Brit. Ent., 13: 177; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 33; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 15; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71:253.

Specimens examined. KOREA-2 females, 17. 13. VII. 1971, Mt. Sudo, GB (K. Yamagishi).

Host. Unknown.

Distribution. Korea, Europe.

Remarks. This species is a larval ectoparasite of leaf-miners, mainly Lepidoptera (Gracillariidae) and their parasites.

19. *Cirrospilus pictus* (Nees, 1834) 무늬털쭈벌(新稱)

(Figs.23-24)

Eulophus pictus Nees, 1834, Hym. Ichneum. aff. Monogr., 2: 165.

Cirrospilus thasus Walker, 1838, Ann. Nat. Hist., 1: 30.

Eulophus arcuatus Foerster, 1841, Beitr. Monogr. Pteromal., p. 41.

Cirrospilus bifasciatus Walker, 1872, Notes on Chalcididae, pt. VI, p. 103.

Cirrospilus pictus var. *alnicola* Erdős, 1956, Folia Ent. Hung., (s. n.), 9: 7.

Cirrospilus pictus: Graham, 1959, Trans. Soc. Brit. Ent., 13: 177; Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 177; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 34; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 15; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 253; Burks, 1979 in Krombein et al, Eulophidae, Cat. Hym. America North of Mexico, V. I. p.987.

Specimens examined. KOREA-8 females, 2 males, ex lepidopterous larvae of leaf feeder on

chestnut, em. 15 VIII. 1980, Yesan, CN.; 2 females, ex *Olethreutes hemiplaca*, em. 26. VI. 1980. Suweon, GG; 3 females, 3 VIII. 1982, Mt. Gaya (650M), GN; 1 female 29. IX. 1980, Gimcheon, Gb; 1 female, 22.VII. 1982, Mt. Baikbong GG; 1 female, 4.VIII. 1980, Suwcon, GG.

Host. *Olethreutes hemiplaca* (Meyrick) (Lep., Tortricidae).

Distribution. Korea, Japan, Europe, Mongolia, North America.

Remarks. This species has a rather wide host range. It is a larval (or rarely pupal) ectoparasite of leaf-mining Coleoptera, Lepidoptera, Hymenoptera and their parasites. The Korean specimens emerged from *O. hemiplaca* pupae.

20. *Diaulynopsis arenarius* (Erdős, 1951) 어리털좀벌 (新稱)

Cycloscapus arenarius Erdős, 1951, Acta biol. Acad. Sci. hung., 2:181–182.

Diaulynopsis arenarius: Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 171; Viggiani, 1967, Boll. Lab.

Ent agr. Filippo Silverstri, 25: 133; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p.39.

This species has a characteristic pale cross band on the gaster. I compared Korean specimen with european specimens determined by Dr. Bouček in Dr. Kamijo's collection. This is the first record of the species from Korea.

Specimen examine. Korea—1 male, 25. VI. 1983, Chuncheon(Mt. Obong), GW.

Host. Unknown.

Distribution. Korea, Europe, Mongolia.

21. *Sympiesis acalle* (Walker, 1948) 날개무늬좀벌 (新稱)

(Figs.25–26)

Eulophus acalle Walker, 1848, List Hym. Ins. Brit. Mus., 2 Chalcidites, p.234.

Entedon nubeculatus Ratzeburg, 1848, Ichneum. d. Forstins., 2: 158.

Eulophus bifaciatus Thomson, 1878, Hym. Scand., 5: 230 (nec Nees, 1834); Erdős, 1954, Ann. hist.-nat. Mus. nat. hung., (s.n.), 6: 15.

Sympiesis acalle: Graham, 1959, Trans. Soc. Brit. Ent., 13: 128; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 40; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 253.

Larval ectoparasite. This species is rather similar to *sericeicornis* (Nees) in the slender gaster of the female and the green-blue or blue-black body with metallic femora. It also resembles *sandanis* (Walker), particularly in the scutellar sculpture and maculate wings. *S. acalle* differs from *sandanis* by having a distinct median carina of the propodeum and the scutellum reticulate (in *sandanis* strigose-reticulate). It can be separated from *sericeicornis* by the bimaculate forewing and shorter pre-stigma.

Specimens examined. KOREA—1 female, 3. VIII. 1982, Mt. Gaya, GN; 1 female, 16.VIII. 1980,

Cheongsong (Mt. Juwang), GB; 2 females, 30.V. 197, Mt. Sudo, GB; 1 female, 2. X. 1982, Mt. Cheonma, GG.

Host. Unknown [Japan-*Phyllonorycter ringoniella* (Matsumura) (Lep., Gracillariidae)].

Distribution. Korea, Japan, Europe.

22. *Sympiesis derogatae* Kamijo, 1965 남작무늬좀벌 (新稱)
(Fig.27)

Sympiesis derogatae Kamijo, 1965, Ins. Matsumurana, 28: 74.

Sympiesis derogatae: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 48; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 254.

This species is a gregarious parasite. It seems to be variable in color and somewhat variable in structure. In typical specimens, the propodeum is densely and weakly reticulate, with a median cerina or groove but in specimens reared from a lepidopterous leaf-folder on *P. thunbergiana* in Suweon, the propodeum is rather smooth. In female there is a dark spot below the stigmal vein. Kamijo (1979) described the variation of the Korean material as follows: "There are two other specimens collected in Prov. Gangwon (No. 324). They agree in most respects with *Sympiesis derogatae*, but the head is bronze and almost alutaceous (in typical specimens the head is greenish with bronzy reflections and relatively strongly sculptured), the eyes are separated by slightly less than their own height, the scutellum is coarsely and strongly reticulate laterally, the first tergite is purple, and the surface of the fore femur has a fuscous patch distally. Further, in one specimen, the fore wing has a faint cloud below the stigmal vein, and in the other one the gaster is slender, much longer than head and thorax combined (43: 34). I am not certain whither these two specimens are within the range of variation of *S. derogatae*".

Specimens examined. KOREA- 1 female, 4 males, ex lepidopterous leaf-folder on *Pueraria thunbergiana*, em. 15. X. 1980., Suweon, GG; 2 females, 13. IX. 1980, 2 females, 20. V. 1980, 1 female, 11. VIII. 1982, Suweon, GG; 1 female, 25. X. 1980, Seoul (Gongneung); 2 females, 28.V. 1979, 2 females, 29. V. 1979, 2 females, 28. VI. 1978, 1 female, 30. VI. 1979, 2 females, 29. VI. 1979, Mt. Sudo (800 mm), GB; 1 female, 29. IX. 1980, 1980, Gimcheon (Temple Jikjisa), GB; 1 female, 25.VIII. 1982, Milyang (Temple Pyeuchungsa), GN.

Host. Unknown [in Japan-*Notarca derogata* (Fabricius) (Lep., Pyralidae)].

Distribution. Korea, Japan.

23. *Sympiesis dolichogaster* Ashmead, 1888 길쭉무늬좀벌 (新稱)
(Figs.28-29)

Sympiesis dolichogaster Ashmead, 1888, Kansas Agr. Exp. Sta. Bull., 3, Appendix, p. 7.

Sympiesis mikado Ashmead, 1904., Jour. New York ent. Soc., 12: 164.

Sympiesis nowickii Szelenyi, 1941, Fragm. Faun. Hung., 4: 27.

Sympiesis mikado: Kamijo, 1965, Ins. matsumurana, 28: 71.

Sympiesis dolichogaster: Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 129; Peck, 1963, Can. Ent. Suppl., 30: 92; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 42; Miller, 1970, Mem. Ent. Soc. Canada, 68: 43; Kamijo, 1976, Kontyu, 44: 485.

The female is very easily distinguished from other species of the genus in having the gaster extraordinarily elongate. *S. dolichogaster* is a solitary parasite (probably ectoparasite) of lepidopterous leaf-miners on deciduous trees. It is newly recorded from Korea.

Specimens examined. KOREA-2 females, ex *Phyllonorycter ringoniella*, em. 25. IX. 1980, Suweon, GG.

Host. *Phyllonorycter ringoniella* (Matsumura) (Lep., Gracillariidae).

Distribution. Korea, Japan Europe, Saghalien, North America.

24. *Sympiesis japonica* Kamijo, 1965 일본무늬좀벌(新稱)
(Figs.30-31)

Sympiesis japonica Kamijo, 1965, Ins. Matsumurana, 28: 73.

Sympiesis japonica: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 44; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 254.

Gregarious larval ectoparasite. Rather distinctive species. It is readily recognizable by the depressed dorsellum.

Specimens examined. KOREA-2 females, 20 V. 1980, 1 female, 11.VIII. 1982, Suweon, GG; 1 male, 29.V.1983, Gwangneung, GG; 1 female, 3.VIII. 1982, Mt. Gaya (650 m), GN; 2 females, 1 male, 28. V. 1979, Mt. Sudo (800 m), GB.

Host. Unknown [in Japan-Tortricidae on *Betula* and *Populus*].

Distribution. Korea, Japan.

25. *Sympiesis sandanis* (Walker, 1839) 점무늬좀벌(新稱)

Eulophus sandanis Walker, 1839, Monogr. Chalciditum, 1: 164.

Eulophus pronoe Walder, 1839, Monogr. Chalciditum 1: 130.

Eulophus laodochus Walker, 1839, Monogr. Chalciditum, 1: 140.

Eulophus debilis Foerster, 1841, Beitr. Mon. Pteromal., p. 42.

Eulophus superior Foerster, 1841, Beitr. Mon. Pteromal., p. 42.

Eulophus damicornis Foerster, 1841, Beitr. Mon. Pteromal., p. 43.

Eulophus atmopterus Ratzeburg, 1852, Ichneum. d. Forstins., 3: 205.

Eulophus atmopterus: Thomson, 1878, Hym. Scand., 5: 233.

Sympiesis sandanis: Graham, 1959, Trans. Soc. Brit. Ent., 13: 183; Bouček, 1959, Acta ent. Mus. nat. Pragae, 33:130; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 45; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 254.

Sympiesis notata: Bouček & Graham, 1978, Entomologist's Gazette, 29: 234; Storozheva, 1982, Ent. Obozr., 61: 173. (Unnecessary emendation).

This species is easy to recognized owing to the coarsely strigose-reticulate scutellum with oblong cells and the fuscous band beneath the stigma of the forewing. Also this species resembles *viridula* (Thomson) and *gregori* Bouček in the slender gaster of the female, the sculpture of scutellum, and the usually complete notauli. *S. notata* (Zetterstedt, 1838) is declared a nomen nudum because Zetterstedt did not described this species.

Host. Unknown [in Europe-Gracillariidae and Tortricidae].

Distribution. Korea, Europe.

26. *Sympiesis ringoniella* Kamijo, 1965 사과무늬좀벌 (新稱)

Sympiesis ringoniella Kamijo, 1965, Ins. Matsumurana, 28: 73.

Sympiesis ringoniella: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p.45; Kamijo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 254.

Chiefly larval, sometimes pupal ectoparasite. This species is characterized as follows: Gaster slender (1.5 times as long as head and thorax combined), the third to fifth gastral tergites with a pair of brownish yellow spots on each segment, largest on fourth; thorax strongly reticulate; propodeum with median carina and the sculpture finer than that of scutellum.

Host. Unknown [in Japan-*Phyllonorycter ringoniella* (Matsumura) (Lep., Gracillariidae)].

Distribution. Korea, Japan.

27. *Sympiesis sericeicornis* (Nees, 1834) 무늬좀벌 (新稱)

(Fig.32-33)

Eulophus sericeicornis Nees, 1834, Hym. Ichneu. aff. Monogr., 2: 168.

Eulophus upupaenellae Bouche, 1834, Naturgesch. d. Insecten, P. 172.

Eulophus eneugamus Walker, 1839, Monogr. Chalciditum, 1: 160.

Eulophus docilis Walker, 1839, Monogr. Chalciditum, 1: 159.

Eulophus sithon Walker, 1839, Monogr. Chalciditum, 1: 181.

Eulophus laticornis Ratzeburg, 1848, Ichn. Forsitins., 2: 162.

Sympiezus punctipleura Thomson, 1878, Hym Scand., 5: 218.

Metacolus conius Provancher, 1887, Add. Corr. Faune Ent. Canada, Hym., p. 200-201.

Coccophagus compressicornis Prvancher, 1887, Add. Corr. Faune Ent. Canada, Hym., p. 206.

Sympiesis nigrifemora Ashmead, 1888, Kansas Agr. Exp. Sta. Bull., 3, Appendix, p. 7.

Sympiesis nigripes Ashmead, 1888, Kansas Agr. Exp. Sta. Bull., 3, Appendix, p. 7.

Segripiesis nigrifemora Webster, 1895, Can. Ent., 27: 68.

Sympiesis massasoit Crawford, 1913, Proc. U. S. nat. Mus., 45: 258.

Sympiesis feketi Gyorffy, 1939, Folia ent. hung., 4: 100.

Sympiesis feketi var. *fulvipes* Gyorfi, 1941, Erdeszeti Kiserletik, 43: 131.

Sympiesis sericeicornis: Erdös, 1956, Fol. ent. hung., (s.n.), 9: 11; 1958, Acta zool. hung., 3: 209; Graham, 1959, Trans. Soc. Brit. Ent., 13: 182; 1963, Trans. Soc. Brit. Ent., 15: 163; Bouček, 1959, Acta ent. Mus. nat. Pragmae, 33: 126; Viggiani, 1963, boll. Lab. Ent. agr. Filippo Silvestri, 21: 24; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 45; Kamijo, 1965, Ins. Matsumurana, 28: 69; 1979, Ann. hist.-nat. Mus. hung., 71: 253.

This species is a solitary, primary or secondary ectoparasite of leaf-miners. In the Korean form, the rami of the male antenna are very short, while they are usually long in the Japanese form. There are rather slight variations in color: Body generally dark green to bluish black; all tibiae usually wholly to partly infuscated, and sometimes fore and middle or rarely all tibiae brownish yellow. The following structural characters also permit *S. sericeicornis* to be rather easily distinguished: post-marginal vein short, about as long as or slightly shorter than parastigma; dorsellum and propodeum smooth and with a distinct median carina.

Specimens examined. KOREA—9 females, 6 males, 23. VIII. 1979, 1 female, 20. IX. 1980, 1 female, 1 male, 25. IX. 1980, 2 females, 28. X. 1983, all reared from *Phyllonorycter ringoniella*, Suweon, GG; 1 male, ex *Phyllonorycter* sp. on *Quercus*, em. 14. III. 1977, Suweon, GG; 5 females, 30. V. 1979, Mt. Sudo, GB; 1 female, 26. VI. 1983, Chuncheon (Mt. Samak), GW.

Host. *Phyllonorycter bicinctella* (Kumata), *P. cavella* (Zeller), *P. ermani* (Kumata), *P. issikii* (Kumata), *P. junglandis* (Kumata), *P. nipponicella* (Issiki), *P. pastorlla* (Zeller), *P. pygmaea* (Kumata), *P. ringoniella* (Matsumura) (Lep., Gracillariidae). Ichneumonid sp. on *Caloptilia* sp. (Kamijo, 1965).

Distribution. Korea, Japan, Europe, Mongolia, North America.

28. *Dimmockia secunda* Crawford, 1910 뭇뻘이좀벌 (新稱)

(Fig. 34)

Dimmockia secundus Crawford, 1910, Tech. Ser. Bur. Ent. U. S. 19: 24.

Encopa reticulata Kamijo, 1965, Ins. Matsumurana, 28: 76.

Dimmockia secunda: Ishii, 1933, Kontyu, 12: 104; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 49; Kamijo, 1976, Kontyu, 44: 490; 1979, Ann. hist.-nat. Mus. nat. hung., 71: 255; Storozheva, 1979, Ent. Obozr., 58: 148.

D. secunda is easily separated from *brevicornis* by the reticulate propodeum, the round scutellum, the anteriorly pointed female abdominal gaster, and the male antennae, in which the scape is swollen and the long-haired branches.

Specimens examined. KOREA—many specimens reared from *Olethreutes hemiplaca*, em. 6—17. VI. 1979, Suweon, GG; 1 female, ex unidentified leaf-roller feed on *Pyrus serotina*, Pyeongtaik, GG; 7 females, ex *Archips breviplicanus*, em. 28. VII. 1983, Suweon, GG; 1 female, 20. V. 1980, 1 female,

11. VIII. 1982., Suweon. GG.

Host. *Olethreutes hemiplacea* (Meyrick), *Archips breviplicanus* Walsingham (Lep., Tortricidae).

Distribution. Korea, Japan, Europe, USSR (Maritime Territory).

29. *Hemiptarsenus dropion* (Walker, 1839) 노랑두줄좀벌 (新稱)

(Fig.35)

Eulophus dropion Walker, 1839, Monogr. Chalciditum, 1: 150.

Eulophus fulvicollis Walker, 1839, Monogr. Chalciditum, 1: 190. (nec Westwood, 1833).

Entedon lepidus Goureau, 1851, Ann. Soc. ent. Fr. (s. 2), 9: 141.

Entedon gratus Goureau, 1851, Ann. Soc. ent. Fr. (s. 2), 9: 143.

Eulophus opicornis Foerster, 1861, Progr. Realschule Aachen, p. 37 (nec Foerster, 1841).

Eulophus fulvicollis: Six, 1876, Tijdschr. Ent., 19: 136; Thomson, 1878, Hym. Scand., 5: 209; Mercet, 1924, Boll. Soc. Esp. Hist. Nat., 24: 460; Erdös, 1951, Acta biol. Acad. Sci. hung., 2: 190.

Hemiptarsenus anementus: Dowden, 1941, Tech. Bull. U. S. Dept. Agric., 757: 35.

Hemiptarsenus dropion: Graham 1959, Trans. Soc. Brit. Ent., 13: 185; 1963, Trans. Soc. Brit. Ent., 15: 190; Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 143; Bouček & Askew, Palaearctic Eulophidae, Index ent. Ins., p. 50; Kamiyo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 255.

Specimens examined. KOREA-2 females, 22. VII. 1982, Mt. Bailbong, GG; 1 female, 21. VI. 1980, Suweon, GG.

Host. Unknown.

Distribution. Korea, Japan, Europe, North America.

Remarks. It has been known that this species is a solitary or gregarious larval or pupal ectoparasite of leaf-mining Coleoptera (Cucurionidae), Lepidoptera (Nepticulidae, Gracillariidae), Hymenoptera (Tenthredinidae) and Diptera (Agromyzidae).

30. *Hemiptarsenus unguicellus* (Zetterstedt, 1838) 두줄좀벌 (新稱)

(Fig.36)

Entedon unguicellus Zetterstedt, 1838, Insecta Lapponica, 1: 427.

Eulophus nycteus Walker, 1839, Monogr. Chalciditum, 1: 128.

Eulophus gonippus Walker, 1839, Monogr. Chalciditum, 1: 132.

Eulophus ianthea Walker, 1839, Monogr. Chalciditum, 1: 135.

Eulophus myodes Walker, 1839, Monogr. Chalciditum, 1: 136.

Eulophus nonus Walker, 1839, Monogr. Chalciditum, 1: 142.

Eulophus hegemon Walker, 1839, Monogr. Chalciditum, 1: 142.

Eulophus laogonus Walker, 1839, Monogr. Chalciditum, 1: 151.

Eulophus villius Walker, 1839, Monogr. Chalciditum, 1: 154.

Eulophus piscus Walker, 1839, Monogr. Chalciditum, 1: 155.

Eulophus drusilla Walker, 1839, Monogr. Chalciditum, 1: 156.

Eulophus alce Walker, 1840, Ann. Nat. Hist., 14: 234.

Eulophus alcicornis Foerster, 1841, Beitr. Monogr. Pteromal., p. 43.

Eulophus opicornis Foerster, 1841, Beitr. Monogr. Pteromal., p. 44 (nec Foerster, 1861).

Eulophus cinctipes Stephens, 1846, Illust. Brit. Ent., Suppl., p. 9.

Eulophus divisus Walker, 1872, Notes on chalcidiae, pt. VII, p. 125.

Hemiptarsenus palustris Erdős, 1954, Ann. hist.-nat. Mus. nat. hung., (s. n.), 5: 334.

Hemiptarsenus unguicellus: Thomson, 1878, Hym. Scand., 5: 211; Mercet, 1924, Boll. Soc. Esp. Hist. Nat., 24: 460; Erdős, 1956, Fol. ent. Hung., (s. n.), 9: 109; Graham, 1959, Trans. Soc. Brit. Ent., 13: 185; Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 140; Hedqvist, 1963, Studia Forest Suec., 11: 143; Bouček & Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 25; Kamiyo, 1978, Kontyu, 46: 458; 1979, Ann. hist.-nat. Mus. nat. hung., 71: 255.

This species varies greatly both in color and in many structural characters. Bouček (1959) stated: The scape may exceed the vertex level slightly to quite fairly; funicle segments may be subequal in length or the first up to 1.66 times as long as the fourth; scutellum is green, concolorous with the thorax, or black violaceous, with reticulation subequal to that of mesoscutum or much finer, usually more or less distinct longitudinally strigose; propodeum with carina and plicae well developed to vague; abdominal petiole black to pale, transverse, subquadrate or even oblong, subpentagonal, with sharp dents instead of without ant distinct corners anteriorly; gaster metallic or with sides testaceous; or sometimes, wholly of latter color; legs also very variable in coloration, in extreme cases pale, or with coxae and femora metallic and tibiae infusate apically. In some specimens of both sexes, the antennae, legs, propodeum and abdominal petiole are longer, while in others these parts are relatively short. This may relate to development on different hosts.

Specimens examined. KOREA- 1 female, 29. V. 1983, 1 female, 9 IX. 1982, 5 females, 2 males, 7. VIII. 1982, Gwangneung, GG; 1 female, 3. X. 1982, Mt. Cheonma, GG; 3 females, 5. VIII. 1980, 1 female, 1 male, 13. IX. 1980, 1 female, 1 male, 4 VIII. 1980, 1 female, 20. V. 1980, Suweon, GG; 2 females, 5 males, 3. VIII. 1980, Mt. Gaya, GB; 2 females, 1 male, 22.VII. 1982, 1 female, 3. X. 1982, 1 male, 17. VII. 1982, Mt. Baikbong, GG.

Host. Unknown [in Japan-*Agromyza oryzae* Munakata (Dipt., Agromyzidae); *Hydrellia griseola* Fallen (Dipt., Ephydriidae); *Elachista* sp. on *Sasa* sp. and *Carex* sp. (Lep., Elachistidae)].

Distribution. Korea, Japan, Mongolia, Afganistan, Europe, North America.

Remarks. The species is a solitary or gregarious larval ectoparasite of leaf-mining Diptera (Agromyzidae) and Lepidoptera (Elachistidae).

31. *Pnigalio katonis* (Ishii, 1953) 굴파리바둑좀벌 (新稱) (Figs.37-38)

Eulophus katonis Ishii, 1953, Bull. Fac. Agr. Tokyo Univ. Agr. Tech., 1: 2.

Pnigalio katonis: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p.55; Kamiyo, 1978, Kontyu, 46: 458.

This species is very close to *P. soemius* (Walker), but differs from the latter by having the median area of the propodeum narrower between the plicae. This is newly recorded from Korea.

Specimens examined. KOREA-6 females, 4 males, ex *Phytomyza horticola*, em. 25. v. 1979, Suweon, GG

Host. *Agromyza albipennis* Meigen, *A. oryzae* Munakata, *Phytomyza horticola* Gourea, *P. ranunculi* Schrank (Dipt., Agromyzidae) (Kamiyo, 1978).

Distribution. Korea, Japan.

32. *Enigalio soemius* (Walder, 1839) 바둑좀벌 (新稱)

Eulophus soemius Walker, 1839, Monogr. Chalciditum, 1: 170.

Eulophus meriones Walker, 1839, Monogr. Chalciditum, 1: 171.

Eulophus prothenor Walker, 1839, Monogr. Chalciditum, 1: 180.

Eulophus punctiscuta Thomson, 1878, Hym. Scand., 5: 228.

Eulophus falvipes Erdős, 1954, Ann. hist.-nat. Mus. nat. hung., (s. n.), 5: 326, 327.

Enigalio soemius: Graham, 1959, Trans. Soc. Brit. Ent., 13: 181 (*soemias* misspelling); 1963, Trans. Soc. Brit. Ent., 15: 183; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 58; Kamiyo, 1979, Ann. hist.-nat. Mus. nat. hung., 71: 255.

Host. Unknown.

Distribution. Korea (North), Europe.

Remarks. Kamiyo (1979) reported *soemius* from North Korea, but I did not succeed to collect it in the southern part of the Korean peninsula. In Europe, it is known as a solitary larval ectoparasite of leaf-mining Coleoptera, Lepidoptera, and Diptera.

33. *Eulophus abdominalis* Nees, 1834 콧사좀벌 (新稱) (Fig.39)

Eulophus abdominalis Nees, 1834, Hym. Ichneum. aff. Monogr., 2: 159.

Eulophus anatole Walker, 1839, Monogr. Chalciditum, 1: 126.

Cratotechus longicornis Thomson, 1878, Hym. Scand., 5: 221.

Comedo abdominalis: Graham, 1959, Trans. Soc. Brit. Ent., 13: 183.

Eulophus abdominalis: Bouček, 1959, Acta ent. Mus. nat. Pragae, 33: 164; Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., P. 61; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 23.

Specimens examined. KOREA-8 females, ex *Acanthoplia agnata*, em. 9. VIII. 1976, Suweon. GG; 1 female, 12. VI. 1979, Suweon. GG.

Host. *Acanthoplia agnata* (Staudinger) (Lep., Noctuidae).

Distribution. Korea, Europe.

Remarks. This species is very easily distinguished from other species of *Eulophus* in having the scutellum gibbous, the third funicular segment 1.5 times as long as broad, and a short but distinct pro-

podeal nect. It is newly recorded from Korea.

34. *Eulophus larvarum* (Linnaeus, 1758) 좀벌 (新稱)

(Fig.40-41)

Ichneumon larvarum Linnaeus, 1758, Systema Naturae, ed. 10. p. 567.

Ichneumon ramicornis Fabricius, 1781, Species Insectorum 1: 441.

Cynips eulophus Fourcroy, 1785, Entomologia Parisiensis, p. 31.

Eulophus damicornis Kirby, 1823, Trans. Linn. Soc. Lond., 14: 112.

Eulophus dimidiatus Nees, 1834, Hym. Ichneum. aff. Monogr., 2: 160.

Eulophus bombycornis Ratzeburg, 1844, Ichneum. d. Forstins., 1: 161.

Eulophus phalaenarum Ratzeburg, 1844, Ichneum. d. Forstinset., 1: 166.

Eulophus fumatus Ratzeburg, 1848, Ichneum. d. Forstinset., 2: 156.

Eulophus mulierosus Karsh, 1879, Sieb. Jahresber. Westf. Prov. Ver., 1878: 31.

Cratotechus hoplitis Crawford, 1911, Proc. U. S. nat. Mus., 39: 622.

Eulophus nigribasis Gradwell, 1957, Ent. mon. Mag., 93: 160.

Cratotechus larvarum: Thomson, 1923, Hym. Scand., 5:220; Dalla Torre, 1898, Cat. Hym., 5:55.

Comedo larvarum: Silvestri, 1923, Boll. Lab. Zool. gen. agr. Portici, 17: 82; Graham 1959, Trans. Soc. Brit. Ent., 13: 183.

Eulophus larvarum: Latreille, 1809, Gen. Crust. & Insect. IV, p. 28; Bouček, 1959, Acta ent. Mus. nat. Praeae, 33: 167; Gijswijt, 1964, Ent. Berichten. 24: 32; Kamijo, 1965, Ins. Matsumurana, 28: 76; 1979, Ann. hist.-nat. Mus. nat. hung., 71: 256; Bouček & Askew, 1968, Palaeartic Eulophidae, Index ent. Ins., p. 62; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 23.

Specimens examined. KOREA: 6 females, ex *Triaena intermedia*, em. 8. VIII. 1977, Suweon, GG; 3 females, 22. IX. 1980, Suweon, GG; 5 females, 2 males, ex *Euproctis similis*, em. 5. VIII. 1980, Suweon, GG.

Host. *Triaena intermedia* (Warren), *Euproctis similis* Fuessly (Lep., Lymantriidae).

Distribution. Korea, Japan, Europe, Mongolia.

35. *Colpoclypeus florus* (Walker, 1839) 꼬마좀벌 (新稱)

(Figs.42)

Eulophus florus Walker, 1839, Monogr. Chalciditum, 1: 127.

Colpoclypeus silvestrii Lucchese, 1941, Boll. Lab. Ent. agr. Filippo Silvestri, 5: 33.

Colpoclypeus silvestrii: Erdős, 1951, Acta bio. hung., 2: 194.

Colpoclypeus florus: Graham, 1959, Trans. soc. Brit. Ent., 13: 178; Bouček, 1959, Acta ent. Mus. nat. Praeae, 33: 169; Bouček & Askew, 1968, Palaeartic Eulophidae, Index ent. Ins., p. 68, Ins., p. 68; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 17.

Specimens examined. KOREA-5 females, 12. VII. 1983, Suweon, GG, ex *Archips breviplicanus* Walsingham on *Prunus tomentosa*.; 5 females, 2 males, 27. IX. 1979, Suweon, GG, ex *Archips* sp. on

Prunus sp.

Host. *Archips breviplicatus* Walsingham (Lep., Tortricidae).

Distribution. Korea, Europe.

Remarks. Dr. K. J. Hedqvist also compared Korean specimens with European specimens of *C. florus* and confirmed they are conspecific.

36. *Diglyphus albiscapus* Erdős, 1951 혼굴파리좀벌 (新稱)

(Figs.43)

Diglyphus albiscapus Erdős, 1951, Acta biol. hung., 2: 196.

Diglyphus albiscapus: Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 69; Kamijo, 1978, Kontyu, 46: 461; 1979, Ann. hist.-nat. Mus. natn. hung., 71: 256.

Specimens examined. KOREA-3 females, ex *Phytomyza horticola*, em. 25. V. 1979, Suweon, GG; 1 female, 4. VIII. 1980, 1 female, 6. VII. 1983, Suweon, GG; Weolak, CB.; 2 females, 18. VII. 1983, Haenam (Mt. Duryun), JN; 2 females, 31. VII. 1980, Island Sinsi-do, JN.

Host. *Phytomyza horticola* Gourea, (Dipt., Agromyzidae)

Distribution. Korea, Japan, Europe.

37. *Diglyphus isaea* (Walker, 1838) 굴파리좀벌 (新稱)

(Fig.44)

Cirrospilus isaea Walker, 1838, Ann. Mag. nat. Hist., 1: 386.

Cirrospilus medius Walker, 1838, Ann. Mag. nat. Hist., 1: 386.

Cirrospilus lycophron Walker, 1838, Ann. Mag. nat. Hist., 1: 449.

Entedon gracilis Goureau, 1851, Ann. Soc. ent. Fr. (2), 9: 159.

Diglyphus ornatus Foerster, 1861, Progr. Realschule Aachen f. 1860(1861), p. 38.

Diglyphus bisannulatus Foerster, 1861, Progr. Realschule Aachen f. 1860(1861), p. 38.

Diglyphus clavicornis Walker, 1872, Notes on Chalcidae, pt. VI, p. 126.

Cirrospilus medius: Dalla Torre, 1898, Cat. Hym., 5: 398.

Asecodes ornatus: Dalla Torre, 1898, Cat. Hym., 5: 436.

Solenotus viridis: Ferriere, 1952, Boll. soc. veneziana Stor. nat., 6: 176; Ishii, 1953, Bull. Fac. Agr. Tokyo Univ. Agr. Tech. 1: 1.

Diglyphus isaea: Graham, 1959, Trans. Soc. Brit. Ent., 13: 178; 1963, Trans. Soc. Brit. Ent., 15: 179
Bouček & Askew, 1968, Palaearctic Eulophidae, Index ent. Ins., p. 70; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b):16; Kamijo, 1978, Kontyu, 46: 456; 1979, Ann. hist.-nat. Mus. nat hung., 71: 256; Gordh & Hendrickson, 1979, Proc. Entomol. Soc. Wash., 81: 677.

Specimens examined. KOREA-Numerous specimens reared from *Phytomyza horticola* Gourea (Dipt., Agromyzidae) on pea, 25. V. 1979, 14. VI. 1983, Suweon, GG; 1 female, 1 male, 10. VI. 1978 Judeog-myeon, CB., ex *P. horticola*; 1 female, 5. VIII. 1982, Seoul (Gongneung).

Host. *Phytomyza horticola* Gourea; *A. albipennis* Meigen (Dipt., Agromyzidae).

Distribution. Korea, Japan, Mongolia, Europe.

Remarks. This species is an ectoparasite of various leaf-mining Diptera. Agromyzidae are the usual hosts, but a species of Lyonetiidae has also been reported as a host (Bouček & Askew, 1968).

38. *Diglyphus minoeus* (Walker, 1838) 검은굴파리좀벌 (新稱)
(Fig.45)

Cirrospilus minoeus Walker, 1838, Ann. Mag. nat. Hist., 1: 385.

Cirrospilus abron Walker, 1838, Ann. Mag. nat. Hist., 1: 385.

Eulophus ameron Walker, 1839, Monogr. Chalciditum, 1: 179.

Cirrospilus myron Walker, 1839, Monogr. Chalciditum, 1: 294.

Cirrospilus deldon Walker, 1839, Monogr. Chalciditum, 1: 294.

Cirrospilus smilis Walker, 1839, Monogr. Chalciditum, 1: 317.

Diglyphus minoeus: Graham 1959, Trans. Soc. Brit. Ent., 13: 178; Bouček & Askew, 1968, Palaearctic Europhidae, Index ent. Ins., p.70; Askew, 1968, Handbk. Id. Brit. Ins., 8, Hym., 2(b): 16; Kamijo, 1978, Kontyu, 46: 460; 1979, Ann. hist. - nat. Mus. nat. hung., 71: 256.

Specimens examined. KOREA—Many specimens reared from *Phytomyza horticola*, 25. V. 1979, Suweon, GG; 3 females, ex *P. horticola*, em. 13. VI. 1978, Gurye, JN.

Host. *Phytomyza horticola* Gourea (Dipt., Agromyzidae).

Distribution. Korea, Japan, Europe.

Remarks. This species is an ectoparasite of leaf-mining Agromyzidae (Diptera) and Lithocolletidae (Lepidoptera) (Bouček & Askew, 1968). In Japan, 3 species of Agromyzidae are known as hosts (Kamijo, 1978).

39. *Diglyphus pusztensis* (Erdos & Novicky, 1951) 남색굴파리좀벌 (新稱)

Cycloscapus pusztensis Erdös & Novicky, 1951 in Erdös, Acta Biol. hung., 2: 181.

Diglyphus tibiscanus Erdös, 1958, Acta zool. Acad. Sci. hung., 3: 211.

Diglyphus fulvipes Erdös, 1961, Ann. hist.-nat. Mus. nat. hung., 53: 474.

Diglyphus pusztensis: Graham, 1963, Trans. Soc. Brit. Ent., 15: 179; Bouček & Askew, 1968, Palaearctic Europhidae, Index ent. Ins., p. 71; Kamijo, 1978, Kontyu, 46: 460.

Specimens examined. KOREA—3 females, 2 males, ex *Phytomyza horticola*, em. 14. VI. 1983, Suweon, GG; 2 females, ex *P. horticola*, em. 11. VI. 1983, Mokpo, JN.; 2 females, 4. VIII. 1980, Suweon, GG.

Host. *Phytomyza horticola* Gourea (Dipt., Agromyzidae).

Distribution. Korea, Japan, Europe.

Remarks. The specimens studied were collected in paddy fields and from undergrowth of natural forests in Japan and Korea. This is the first record from Korea.

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한국産 쯔벌亞科의 分類(별目: 쯔벌科)

白 種 哲

順天大學校 農生物學科

한국産 쯔벌亞科의 정리결과 총 39종이 분류·동정되었으며 이중 16종은 한국 未記錄種이었다. 또한 *Elachertus tabashii* Nakayama, 1938은 노랑쯔벌 (*Stenomesus japonicus* (Ashmead, 1904))의 synonym으로 처리하였다.

검색어: 분류, 별目, 쯔벌科, 쯔벌亞科

Explanation of the figures.

- Figs. 1-2. *Euplectrus platyphypenae* Howard, 1: head & thorax; 2: propodeum & gaster.
- Figs. 3-4. *Euplectrus bicolor* (Swederus), 3: thorax, 4: propodeum & gaster.
- Figs. 5-6. *Platyplectrus laeviscutus* (Thomson), 5: thorax, 6: propodeum & petiole.
- Figs. 7. *Platyplecturs pannonicus* (Erdös), thorax
- Figs. 8. *Platyplecturs chlorocephalus* (Nees), thorax
- Fig. 9. *Stenomesus japonicus* (Ashmead), thorax
- Fig. 10. *Elachertus isadas* (Walker), thorax
- Figs. 11-12. *Elachertus charondas* (Walker), 11: thorax, 12: Propodeum & gaster.
- Figs. 13-14. *Elachetus inunctus* (Nees), 13: thorax, 14: propodeum & gaster.
- Fig. 15. *Elachertus artaeus* (Walker), thorax.
- Figs. 16-17. *Elachertus longipitilus* Bouček, 16: propodeum & petiole, 17: head & thorax.
- Figs. 18-19. *Elachertus argissa* (Walker), 18: propodeum & gaster, 19: scutellum.
- Figs. 20-21. *Cirrospilus diallus* Walker, 20: head & thorax, 21: propodeum & gaster.
- Fig. 22. *Cirrospilus lyncus* Walker, thorax.
- Figs. 23-24. *Cirrospilus pictus* (Nees), 23: head & thorax, 24: propodeum & gaster.
- Figs. 25-26. *Sympiesis acalle* (Walker), 25: head & thorax, 26: propodeum & gaster.
- Fig. 27. *Sympiesis derogatae* Kamijo, head & thorax.
- Figs. 28-29. *Sympiesis dolichogaster* Ashmead, 28: propodeum, 29: gaster.
- Figs. 30-31. *Sympiesis japonica* Kamijo, 30: thorax, 31: scutellum & propodeum.
- Figs. 32-33. *Sympiesis sericeicornis* (Nees), 32: thorax, 33: scutellum & propodeum.
- Fig. 34. *Dimmockia secunda* Crawford, thorax.
- Fig. 35. *Hemiptarsenus dropion* (Walker), scutellum & propodeum.
- Fig. 36. *Hemiptarsenus unguicellus* (Zetterstedt), scutellum & propodeum.
- Figs. 37-38. *Phygadeuon katonis* (Ishii), 37: head & thorax, 38: scutellum & propodeum.
- Fig. 39. *Eulophus abdominalis* (Nees), thorax.
- Figs. 40-41. *Eulophus larvarum* (Linnaeus), 40: thorax, 41: propodeum & gaster.
- Fig. 42. *Colpoclypeus florus* (Walker), scutellum, & propodeum.
- Fig. 43. *Diglyphus albiscapus* (Erdös), thorax.
- Fig. 44. *Diglyphus isaea* (Walker), thorax.
- Fig. 45. *Diglyphus minoeus* (Walker), thorax & gaster.









